

REMARKS

Claims 18 and 48 have been amended. Claims 18 - 24, 30, and 48 - 61 are currently pending in the present application.

In the Office Action, claims 18 - 24 and 30 are rejected under 35 U.S.C. §102(b) as being anticipated by US Patent No. 2,820,304 to Horecky. Moreover, in the Office Action, claims 48, 51, and 54 are rejected under 35 U.S.C. §102(b) as being anticipated by US Patent No. 3,266,167 to Finnegan. Additionally, in the Office Action, claims 49 - 50, 52 - 53, 57, and 61 are rejected under 35 U.S.C. §103(a) as being unpatentable US Patent No. 3,266,167 to Finnegan. Furthermore, in the Office Action, claim 54 is rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 3,266,167 to Finnegan in view of Turetta et al US Patent No. 5,228,212. Also, in the Office Action, claims 55 - 56, 58, and 60 are rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 2,820,304 to Horecky.

The Claimed Invention

The present invention as exemplified by, for example, an exemplary embodiment recited in independent claim 48 of the present application as currently amended, relates to a laundry dryer that includes an electrode of a moisture sensor fixed to a respective receiving area of the laundry dryer and a cooler that cools the electrode, the cooler operating to reduce a temperature of the part of the at least one electrode below a temperature of the respective receiving area of the laundry dryer. Conventional laundry dryers are sometimes provided with electrodes for measuring conductance of a current that has passed through wet laundry and certain ones of these electrodes are exposed to the moist air that obtains within the laundry receiving area of a clothes dryer. Exposed surfaces of such electrodes heat up as a result of voltages applied to the electrodes, whereupon such heated up electrodes may evaporate moist air proximate to such electrodes with the result that deposits and laundry fluid residues previously

entrained in the moist air disentrain from the moist air and build up a film on the electrodes. The conventional approach to addressing this film has been to frequently clean the electrodes. However, these electrodes are difficult and expensive to clean. The present invention thus provides a solution for preventing or at least minimizing the build up of film on the electrodes.

The References

Horecky '304 discloses a clothes drying machine 10 having a drum 17 and a control arrangement including a humidistat 50. The humidistat 50 has a casing in which a pair of electrodes 56, 57 are supported. A fibrous glass material 60 surrounds the electrodes 56, 57 and a current of air that has exited the interior of the drum 17 passes into the fibrous glass material 60 via perforations in the casing of the humidistat 50.

As time proceeds, the moisture contained in the clothes tumbling in the drum 17 is evaporated therefrom and removed by the current of hot air circulated therethrough, whereby the current of hot air passing through the passage 35 and through the humidistat 50 becomes progressively drier so that this relatively dry hot air also effects the removal of moisture from the fibrous material 60 in the humidistat 50 with the result that the amount of moisture adsorbed by the fibrous material 60 is reduced bringing about a corresponding increase in the resistance of the circuit path between the electrodes 56 and 57. As the resistance of this circuit path is thus increased, the voltage drop thereacross is correspondingly increased with the result that there is a reduction in the voltage drop across the resistor R1, whereby ultimately the resistance of the circuit path between the electrodes 56 and 57 becomes controlling.

Finnegan '167 discloses a domestic clothes dryer 11 having two sensing or pickup electrodes 31, 33 each electrically insulated from a drum 15.

Turetta et al '212 discloses a clothes dryer 1 having a cabinet 2 with an aperture 3, to coincide with which there is positioned a door 4 provided with usual seal gaskets 5 and in which a filter element 24A is disposed. The aperture 3 provides access to a

usual drum 6 through which hot air circulation is generated to dry the clothes. Means are provided to produce this circulation and heating, said means being (in the example shown in FIG. 1 and in FIGS. 2 to 5) a fan 7, a resistance element 8, a heat exchanger 9 and relative ducts 10A for feeding dry hot air C into the drum 6, 10B for removing the wet hot air U therefrom (provided partly within the door 4) and 10C for feeding cold air F to said fan 7. This air F originates from the heat exchanger 9 which in the example is of the countercurrent type. Cold air E originating from the outside of the cabinet 2 passes through it by being fed through a duct 12 by a second fan 13. The duct 12 opens again to the outside of the cabinet 2 via an aperture from which hot air G emerges. The water H contained in the moist hot air U condenses as this latter passes through the heat exchanger 9 and falls into a first collection vessel 15. This is connected via a pipe 16 to a pump 17 from which a further pipe 18 extends to terminate in a second collection vessel 19. Turetta et al US Patent No. 5,228,212 also discloses, as shown in Figure 5 thereof, that a circuit for producing hot air may be formed of a usual refrigeration circuit comprising substantially a compressor 70, a condenser 71 and an evaporator 72, the compressor 70 being connected to a power feed line 73 which includes a contactor 74 normally closed during machine operation.

Favorable reconsideration of the rejections of claims 18 - 24, 30, and 48 - 61 is respectfully requested in view of the amendments of claims 18 and 48 and the following comments.

The Rejection Of Claims 18 - 24 and 30 As Anticipated under 35 U.S.C. §102(b) By Horecky '034

Claims 18 - 24 and 30 are rejected under 35 U.S.C. §102(b) as being anticipated by Horecky '034. It is respectfully submitted that claim 18 as currently amended, and claims 19 - 24 and 30 all ultimately depending from claim 18, are patentable over Horecky '034 for the reason that Horecky '034 neither discloses nor teaches the device for determining the conductance of laundry in a laundry drier as recited in these claims.

Horecky '034 discloses a system for detecting dryness in exit air exiting from a clothes dryer. Horecky '034 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a means for heat reduction from at least a part of at least one of the electrodes, as recited in independent claim 18 of the present application. Instead, Horecky '034 does not appear to recognize the desirability of reducing heat relative to its electrodes 56, 57. Moreover, the electrodes 56, 57 of Horecky '034 do not receive any cooling at all. These electrodes are packed into a fibrous material and stuffed into a "humidistat" which is placed in the flow of process air leaving the drum with the laundry to be dried. Accordingly, the electrodes 56, 57 of Horecky '034 will substantially attain the temperature of the process air and will not attain a lower temperature. Thus, it is clear that Horecky '034 would not hint at or suggest to one of ordinary skill in the art to consider a means for reducing heat on either of the electrodes and it is submitted that claims 18 - 24 and 30 of the present application are neither disclosed nor taught by Horecky '034 and the rejections of these claims as anticipated by Horecky '034 should be withdrawn.

The Rejection Of Claims 48, 51, and 54 As Anticipated under 35 U.S.C. §102(b) By Finnegan '167

Claims 48, 51, and 54 are rejected under 35 U.S.C. §102(b) as being anticipated by Finnegan '167. It is respectfully submitted that claim 48 as currently amended, and claims 51 and 54 all ultimately depending from claim 48, are patentable over Finnegan '167 for the reason that Finnegan '167 neither discloses nor teaches the laundry dryer as recited in these claims. Finnegan '167 discloses a system for detecting dryness in exit air exiting from a clothes dryer. Finnegan '167 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a cooler that cools the electrode, as recited in independent claim 48 of the present application. Instead, Finnegan '167 does not appear to recognize the desirability of reducing heat relative to its electrodes, let alone recognize the desirability of a cooler that cools an

electrode. Moreover, the electrodes of Finnegan '167 are placed on the inside of the drum mantle. Even if it would be assumed that the drum itself would effect some dissipation of heat to the exterior of the drum and thus provide a degree of cooling to the drum mantle, such cooling would reduce the temperature of the electrodes to the temperature of the surrounding drum mantle itself. Assuming that the electrodes are insulated from the drum, they would retain a temperature slightly above the temperature of the drum mantle because of the partial thermal isolation given by the electric insulation. Thus, it is clear that the electrodes of Finnegan '167 will not attain a temperature below the temperature of their receiving area. Accordingly, it is clear that Finnegan '167 would not hint at or suggest to one of ordinary skill in the art to consider a cooler for cooling electrodes and it is submitted that claims 48, 51, and 54 of the present application are neither disclosed nor taught by Finnegan '167 and the rejections of these claims as anticipated by Finnegan '167 should be withdrawn.

The Rejection Of Claims 49 - 50, 52 - 53, 57, and 61 As Unpatentable under 35 U.S.C. §103(a) Over Finnegan '167

Claims 49 - 50, 52 - 53, 57, and 61 are rejected under 35 U.S.C. §103(a) as being unpatentable over Finnegan '167. It is respectfully submitted that these claims, which all ultimately depend from claim 48, are patentable over Finnegan '167 for the reason that Finnegan '167 neither discloses nor teaches the laundry dryer as recited in these claims. Finnegan '167 discloses a system for detecting dryness in exit air exiting from a clothes dryer. Finnegan '167 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a cooler that cools the electrode, as recited in independent claim 48 of the present application. Instead, Finnegan '167 does not appear to recognize the desirability of reducing heat relative to its electrodes, let alone recognize the desirability of a cooler that cools an electrode. Thus, it is clear that Finnegan '167 would not hint at or suggest to one of ordinary skill in the art to consider a cooler for cooling electrodes and it is submitted that

claims 49 - 50, 52 - 53, and 57 of the present application are neither disclosed nor taught by Finnegan '167 and the rejections of these claims as unpatentable over Finnegan '167 should be withdrawn.

The Rejection Of Claim 54 As Unpatentable under 35 U.S.C. §103(a) Over Finnegan '167 In View Of Turetta et al '212

Claim 54 is rejected under 35 U.S.C. §103(a) as being unpatentable over Finnegan '167 in view of Turetta et al '212. It is respectfully submitted that this claim, which depends from claim 48, is patentable over Finnegan '167 and Turetta et al '212 for the reason that neither Finnegan '167 or Turetta et al '212 discloses nor teaches the laundry dryer as recited in this claim. Finnegan '167 discloses a system for detecting dryness in exit air exiting from a clothes dryer. Finnegan '167 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a cooler that cools the electrode, as recited in independent claim 48 of the present application. Instead, Finnegan '167 does not appear to recognize the desirability of reducing heat relative to its electrodes, let alone recognize the desirability of a cooler that cools an electrode. Turetta et al '212 does not remedy the deficiencies of Finnegan '167. Thus, it is clear that neither Finnegan '167 nor Turetta et al '212 hint at or suggest to one of ordinary skill in the art to consider a cooler for cooling electrodes and it is submitted that claim 54 of the present application is neither disclosed nor taught by Finnegan '167 or Turetta et al '212, either alone or in combination, and the rejection of this claim as unpatentable over Finnegan '167 in view of Turetta et al '212 should be withdrawn.

The Rejection Of Claims 55 – 56, 58, and 60 As Unpatentable under 35 U.S.C. §103(a) Over Horecky '034

Claims 55 – 56, 58, and 60 are rejected under 35 U.S.C. §103(a) as being unpatentable over Horecky '034. It is respectfully submitted that these claims, which all ultimately depend from claim 18, are patentable over Horecky '034 for the reason that Horecky '034 neither discloses nor teaches the device for determining the conductance of laundry in a laundry drier as recited in these claims. Horecky '034 discloses a system for detecting dryness in exit air exiting from a clothes dryer. Horecky '034 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a means for heat reduction from at least a part of at least one of the electrodes, as recited in independent claim 18 of the present application. Instead, Horecky '034 does not appear to recognize the desirability of reducing heat relative to its electrodes 56, 57. While it may be expected that humidity at the location of the electrodes 56, 57 of Horecky '034 will be equal more or less to the humidity of the air flow around the two-part casing enclosing these electrodes due to a branching off of a portion of the air flow to the casing and the fibrous material 60I, or due to mere diffusion, Horecky '034 does not disclose or suggest any structure or approach that could serve to lower the temperature of at least one of the electrodes 56 and 57 below the temperature of the surrounding fibrous material 60 and the casing. The electrodes 56 and 57 will simply retain the temperature of their immediate surroundings and there is no explicit or implicit indication in Horecky '034 that would lead a skilled person viewing the Horecky '034 arrangement to consider lowering the temperature of at least one of the electrodes 56 and 57.

Even further, Horecky '034 does not suggest or hint at a system for determining the conductance of laundry in a laundry drier that includes a means for heat reduction having the particular configuration recited in claim 56 of the present application. Claim 56 of the present application sets forth that the electrodes form a voltage applying arrangement and the respective one electrode whose heat is reduced by the means for heat reduction is exposed to an interior of the laundry receiving area of the laundry dryer to an extent that the respective one electrode is contacted by liquid entrained in a liquid - air mixture in the interior of the laundry receiving area of the laundry dryer and

the device is operable to reduce the heat of the respective one electrode to a level at which the respective one electrode substantially avoids evaporating such entrained liquid. In the Horecky '034 arrangement, its electrodes 56, 57 are encased in a casing formed of the lower casing section 51 and the upper casing section 52 and the electrodes 56, 57 are surrounded by fibrous material 60. Thus, the Horecky '034 arrangement provides no structure that, in the language of claim 56 of the present application, is "operable to reduce the heat of the respective one electrode to a level at which the respective one electrode substantially avoids evaporating such entrained liquid."

The deficiencies of Horecky '034 as a prior art reference capable of rendering obvious the present invention are particularly apparent when considering claim 60 of the present application. Claim 60 of the present application recites that the at least two electrodes of the device for determining the conductance of laundry in the laundry receiving area recited in claim 18 are in the form of a first electrode and a second electrode, the first electrode having an exposed side that is exposed to a moist air mixture in a laundry receiving area of the laundry dryer in which laundry is retained. The moist air mixture occurs when laundry in the laundry retaining area is subjected to a drying operation that results in moisture initially retained by the laundry being released into surrounding air as the laundry is dried and the surrounding air increasing in its moisture content as a consequence thereof. According to claim 60, the device is operable to apply a voltage to the first electrode and the second electrode of the exposed side arrangement that results in a current passing through laundry retained in the laundry receiving area, thereby permitting a voltage measurement proportional to a moisture content of the laundry and the device applies a voltage in a manner such that the exposed side of the second electrode of the exposed side arrangement can reach an evaporation enabling temperature sufficient to evaporate liquid in the air mixture in contact with the exposed side in the absence of a heat abatement measure. Furthermore, as recited in claim 60, the means for heat reduction from at least a part of at least one of the electrodes operates to reduce heat from the first electrode such that

the exposed side of the first electrode is substantially prevented from reaching the evaporation enabling temperature in spite of the application by the device of a voltage that would otherwise cause the exposed side of the second electrode to reach the evaporation enabling temperature.

As noted, the Horecky '034 arrangement does not teach or disclose, or even suggest the desirability of, a structure that reduces the heat imposed on either of its electrodes 56, 57. The present invention provides a solution for preventing or at least minimizing the build up of film on the electrodes for the reason that a build up of film on the electrodes in the form, for example, of deposit layers on the electrodes made by water contents and laundry substances, disadvantageously leads to a drift in the moisture measuring results. In the configuration of this solution set forth in claim 60, a build up of film on the first electrode is minimized in that the means for heat reduction operates to reduce heat from the first electrode such that the exposed side of the first electrode is substantially prevented from reaching the evaporation enabling temperature. This beneficially avoids the unwanted circumstance in which an otherwise hot electrode would evaporate water and thus release from suspension in the water solids such as laundry fluid residues that could build up as deposits on the electrode.

With regard to any teaching or suggestion in Horecky '034 that it is advantageous to prevent a release of suspended solids from the laundry water that could then build up as deposits on an electrode, Horecky '034 not only lacks any such teaching or suggestion, Horecky '034, in fact, discloses – for the purpose of controlling the resistance of the electrical path through its fibrous material 60 between its electrodes 56 and 57- the desirability of providing an electrolyte in the moisture adsorbed by the fibrous material 60. See, for example, Column 4, lines 9 – 17, of Horecky '034. As the fibrous material 60 is in direct contact with the electrodes 56 and 57, a deposition of electrolytes in the fibrous material 60 may promote, not discourage, a build up of deposits on the electrodes 56 and 57. It is accordingly submitted that one of skill in the art would not be taught or guided by Horecky '034 to provide a device for determining

the conductance of laundry having the characteristics of the device recited in claim 60 of the present application.

Accordingly, it is clear that Horecky '034 would not hint at or suggest to one of ordinary skill in the art to consider a means for reducing heat on an electrode of a device for determining the conductance of laundry and it is submitted that claims 55 – 56, 58, and 60 of the present application are neither disclosed nor taught by Horecky '034 and the rejections of these claims as unpatentable over Horecky '034 should be withdrawn.

CONCLUSION

In view of the above, entry of the present Amendment and allowance of claims 18 - 24, 30, and 48 - 61 is respectfully requested. If the Examiner has any questions regarding this Amendment, the Examiner is requested to contact the undersigned. If an extension of time for this paper is required, petition for extension is herewith made.

Respectfully submitted,

/James E. Howard/

James E. Howard
Registration No. 39,715
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BSH Home Appliances Corporation
100 Bosch Blvd.
New Bern, NC 28562
Phone: 252-639-7644
Fax: 714-845-2807
james.howard@bshg.com